

PARAPERCIS DIPLOSPILUS (PISCES:
MUGILOIDIDAE), A NEW SPECIES
FROM THE PHILIPPINE ISLANDS

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Abstract.—*Parapercis diplospilus* n. sp., from the Visayan Sea between northern Negros and Masbate islands, is most similar to *Parapercis ommatura* Jordan and Snyder, 1902, from which it differs most notably in having two prominent spots on the caudal-fin base instead of one, 22 to 23 instead of 23 to 26 scale rows around the caudal peduncle, and 9 to 11 instead of 12 to 13 scale rows below the lateral line. It also differs in certain body proportions and in having the caudal fin truncate with its dorsalmost rays slightly prolonged rather than rounded as in *P. ommatura*.

In 1978, the Smithsonian Institution's expedition to the Philippine Islands collected 21 specimens of an undescribed species of *Parapercis*. This species is herein described and compared with *P. ommatura*, to which it is most similar. *P. ommatura* is known from Japan, Korea, and China.

Cantwell (1964) last revised the Indo-Pacific *Parapercis*, in which he treated 26 species. Schultz (1968) added six more: four newly described, one he had described in 1966, and one described by Kamohara (1960). He failed to include *P. elongata* Fourmanoir (1965) and *P. guezei* Fourmanoir (1966).¹ Since that time, four additional Indo-Pacific species have been described: *P. dockinsi* McCosker (1971), *P. gushikeni* Yoshino (1975), *P. biordinis* Allen (1976), and *P. cephalus* Kotthaus (1977). Current work by G. Stroud and J. E. Randall is expected to change the status of some of these species and add new ones.

Methods

Methods and terminology are those of Hubbs and Lagler (1958) except for the following as modified by Cantwell (1964): in the pectoral fin the unbranched, dorsalmost ray is indicated by a lower case Roman numeral and the branched rays by Arabic numerals; each dorsal- and anal-fin ray with a separate external base was counted as one; lateral-line scale counts

¹ *Parapercis elongata* was first described in 1965 under the name *Parapercis* sp., although referred to as *P. elongata* in the text of the description and in the index. Fourmanoir re-described the species in 1967.

include all pored scales in the series; counts of scale rows above the lateral line were begun at the origin of the first segmented dorsal-fin ray; scale counts below the lateral line were made along an oblique row from the anterior margin of the anus dorsoposteriorly to the lateral line. Vertebral counts, not including the urostylar vertebra, and median-fin ray counts were taken from radiographs. Fleishy orbit diameter is a horizontal measurement. Measurements (to the nearest 0.1 mm) were made with needlepoint dial calipers or with an ocular micrometer.

Type material has been deposited in the following collections: British Museum (Natural History), London (BMNH); Australian Museum, Sydney (AMS); Bernice P. Bishop Museum, Honolulu (BPBM); California Academy of Sciences, San Francisco (CAS); National Museum of Natural History, Smithsonian Institution, Washington, D.C. (USNM).

Parapercis diplospilus, new species

Figs. 1, 2

Holotype.—USNM 220470 (75.0 mm SL), Philippine Islands, Visayan Sea between northern Negros and Masbate islands, southeast of Sicogon Island, 11°22'00"N, 123°19'48"E, 38.4 meters, 9 June 1978, Smithsonian Philippines Expedition 1978, sta. T-29, L. Knapp and party.

Paratypes.—All collected by the Smithsonian Philippines Expedition 1978, L. Knapp and party, in the Visayan Sea between northern Negros and Masbate islands. BPBM 22770 (3, 56.6–78.0), AMS I.21362-001 (3, 64.0–76.9), BMNH 1979.11.2.1–3 (3, 56.9–73.4), CAS 44715 (3, 61.7–70.1), all same data as holotype; USNM 220406 (1, 56.5), southeast of South Gigante Island, 11°30'23"N, 123°23'45"E, 38.4 meters, 8 June 1978, sta. T-27; USNM 220407 (1, 48.7), east of South Gigante Island, 11°31'38"N, 123°31'00"E, 38.4 meters, 8 June 1978, sta. T-26; USNM 220409 (6, 51.6–66.6), east of Sicogon Island, 11°27'45"N, 123°23'45"E, 47.6 meters, 4 June 1978, sta. T-3.

Diagnosis.—A species of *Parapercis* with: palatine teeth absent; usually 7 or 8 teeth in outer row of lower jaw; dorsal-fin rays V,22 (rarely VI,22); fourth dorsal-fin spine longest (fifth in a specimen with six spines), 6.4–7.8% SL; last dorsal-fin spine connected by membrane to base of first dorsal-fin ray (Fig. 2); anal-fin rays I,18; pectoral-fin rays i,13–i,15; scales below lateral line 9–11; scale rows around caudal peduncle 22–23; two prominent dark spots on caudal base, the upper one appearing ocellated in most specimens, the lower of equal size or slightly longer, but not ocellated.

Description.—Meristic values for the holotype are indicated by asterisks with the number of specimens having a given value placed in parentheses; morphometric values are expressed as percentages of SL, with values for the holotype given in parentheses after the ranges. The range of SL is 48.7 to 78.0 mm.



Fig. 1. *Parapercis diplospilus* n. sp., holotype, USNM 220470, 75.0 mm SL.

Dorsal fin V,22*(20) or VI,22(1); anal fin I,18; principal caudal rays 8 + 7; pectoral fin i,13*(7), i,14(13) or i,15(1); pelvic fin I,5; vertebrae 10 + 19*(19) or 10 + 18(1) (one additional specimen abnormal with some vertebrae fused); gill rakers 8(3), 9*(5), 10(10), 11(2) or 12(1); lateral-line scales 58(3), 59*(8) or 60(6); scales above lateral line 3(1) or 4*(16); scales below lateral line 9–11*; scale rows around caudal peduncle 22–23*.

Body elongate, greatest depth, at about level of anal opening, 14.5–17.6 (17.1); least depth of caudal peduncle 7.7–8.5 (7.9); tip of lower jaw to anal origin 39.6–43.5 (41.7). Head length 26.4–28.7 (26.4); snout length to fleshy orbit 6.5–7.1 (6.5); fleshy orbit diameter 6.0–7.9 (6.0); least fleshy interorbital width 2.2–2.5 (2.5); mouth oblique, lower jaw projecting beyond upper; maxilla reaching slightly posterior to a vertical through anterior edge of orbit; snout tip to rear edge of maxilla 7.2–9.1 (8.4); preopercle with 1–12 small spines on margin of angular portion; posterior margin of operculum with 1 strong spine at upper angle, not covered by skin posteriorly, and 11–21 small spines along ventral margin. Dorsal-fin base 62.0–68.0 (65.2); dorsal-fin spines increasing in length to fourth spine, fourth spine 6.4–7.8 (6.4), length of fifth spine about equal to third; dorsal-fin rays longer than spines; anal-fin base 45.3–49.9 (49.2); anal-fin origin approximately below fifth segmented dorsal-fin ray; posterior anal-fin base below posterior base of dorsal fin, appressed tips of posterior rays of both fins reaching almost to caudal-fin base; caudal fin truncate, uppermost rays slightly prolonged; pectoral fin acutely rounded, length 17.3–20.0 (18.8), reaching to or slightly posterior to vertical through anal-fin origin; pelvic fin pointed, fourth ray longest, reaching vertical through anus or between anus and anal-fin origin, fin length 19.9–23.6 (19.9).

Based on a Student's *t* test for allometry at the 95% level of significance, fleshy orbit diameter and length of fourth dorsal spine are negatively allometric. Greatest body depth is positively allometric. The remaining morphometric characters are isometric.

Teeth in 2 series on both jaws. Outer series of upper jaw a single row of

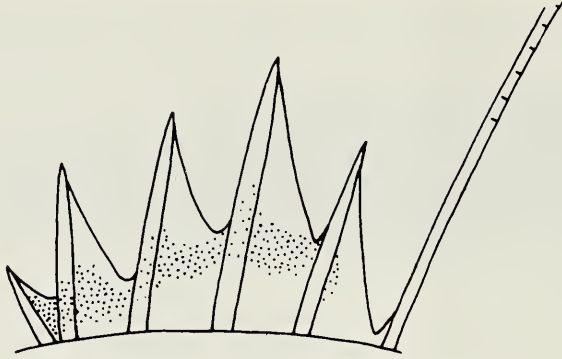


Fig. 2. Semidiagrammatic drawing of dorsal-fin spine arrangement of *Parapercis diplospilus*.

large, curved, conical teeth decreasing in size posteriorly; inner series a band of dense villiform teeth with depth of band decreasing posteriorly. Usually 8 (6–11) large, curved, conical teeth in outer row of lower jaw; inner series a band of villiform teeth mesially and a single row of small conical teeth laterally. Palatine teeth absent. Vomer with a chevron-shaped patch of small conical teeth in 2 to 3 rows.

Scales ctenoid; small scales extending onto basal half of caudal fin and basal sixth of pectoral fin in some specimens; snout, interorbital space, and occiput naked.

Color in preservation.—Background color of body and head yellowish to tan; free edges of body scales and scale pockets above lateral line with dark brown melanophores giving a tessellated, overall dark appearance to upper half of body; six or seven indistinct V-shaped markings of a darker brown also on upper half of body, relatively evenly spaced between head and caudal base, the more anterior markings extending slightly below lateral line; ventral half of body paler, with a row of eight dark-brown spots alternating small and large in size, in some specimens these spots extending ventrad to anal fin as faint vertical or oblique bars; a row of smaller, paler, and less distinct spots slightly above larger spots and just below lateral line; faint vertical bar extending from axilla to ventral body midline in some specimens; anal opening with U-shaped ring of dense, dark brown melanophores. Scaled portion of dorsal head surface with same tessellated appearance as upper body; cheek and operculum with 2 to 3 irregular dark-brown blotches; upper naked areas of head with small brown spots; lips and chin with scattered dark-brown melanophores, upper lip darkest mesially; lower surface of head, branchiostegal membranes, and isthmus without melanophores. Spinous dorsal fin with large, diffuse, dark spots on membranes

forming a band between first and fifth spines, membranes between first and third spines almost entirely covered with melanophores; soft dorsal fin with 2 to 3 rows of elongate, dark spots on membranes; anal fin with dark melanophores on anterior halves of membranes between consecutive rays, posterior portions of membranes without melanophores; caudal-fin base with two prominent, dark spots, each approximately pupil size, the upper spot appearing ocellated in some specimens, the lower spot often slightly more elongate and non-ocellate; very faint, irregular, narrow, dark bars posterior to prominent, dark spots; tips of mesial caudal-fin rays in some specimens, and all caudal-fin ray tips in others, dark brown; pectoral fin with scattered large, dark, melanophores at distal margin, fin base with an oblique dark bar; pelvic fin dark except for spine and distal margin.

Reproduction.—Hermaphroditism in mugiloidids was first suggested by Marshall (1950). He believed *P. hexophthalma* and *P. polyophthalma* to be males and females, respectively, of the same species, with males invariably being larger than females. One specimen intermediate in color pattern between the *hexophthalma* and *polyophthalma* forms appeared to have both ovarian and testicular tissue. G. Stroud (in litt.) has confirmed this suggestion of protogynous hermaphroditism, and along with J. E. Randall (in litt.) indicated that other species of *Parapercis* also reverse sex.

Gross examination of the gonads of the 21 type specimens (48.7–78.0 mm SL) of *P. diplospilus* showed all to have well developed ova. Examination of serial histological sections from the gonad of a 78 mm specimen (the only specimen sectioned) revealed the presence of both ovarian and testicular tissue with spermatids. Although examination of a series of specimens is needed for final determination of sexual mode, it is possible that *P. diplospilus* represents another example of protogynous hermaphroditism in *Parapercis*.

Distribution.—Known only from the type specimens collected by trawl in the Visayan Sea, Philippine Islands, at 38.4 to 47.6 meters depth. Scuba and rotenone collecting efforts to the south (Mindanao Sea and Tonon Strait) and to the east (Cuyo Islands) of the Visayan Sea failed to take this species.

Etymology.—The specific name is a noun in apposition taken from the Greek *diplo*, double, and *spilos*, spot, in reference to the two prominent caudal-fin spots.

Comparisons.—*Parapercis diplospilus* keys to *P. ommatura* Jordan and Snyder (1902), in Kamohara's (1960) review of Japanese parapercids, in Cantwell's (1964) revision of the genus, and in Schultz's (1968) review containing an expanded, modified key. Diagnostic characters shared by these two species are: dentition, as described above; spinous dorsal fin with middle rays longest, last spine connected by membrane to base of first segmented dorsal-fin ray (Fig. 2); caudal vertebrae 19; dorsal fin V,22; anal fin i,18 (rarely i,19 in *P. ommatura*); pectoral fin i,13 or i,14 (rarely i,15); dark,

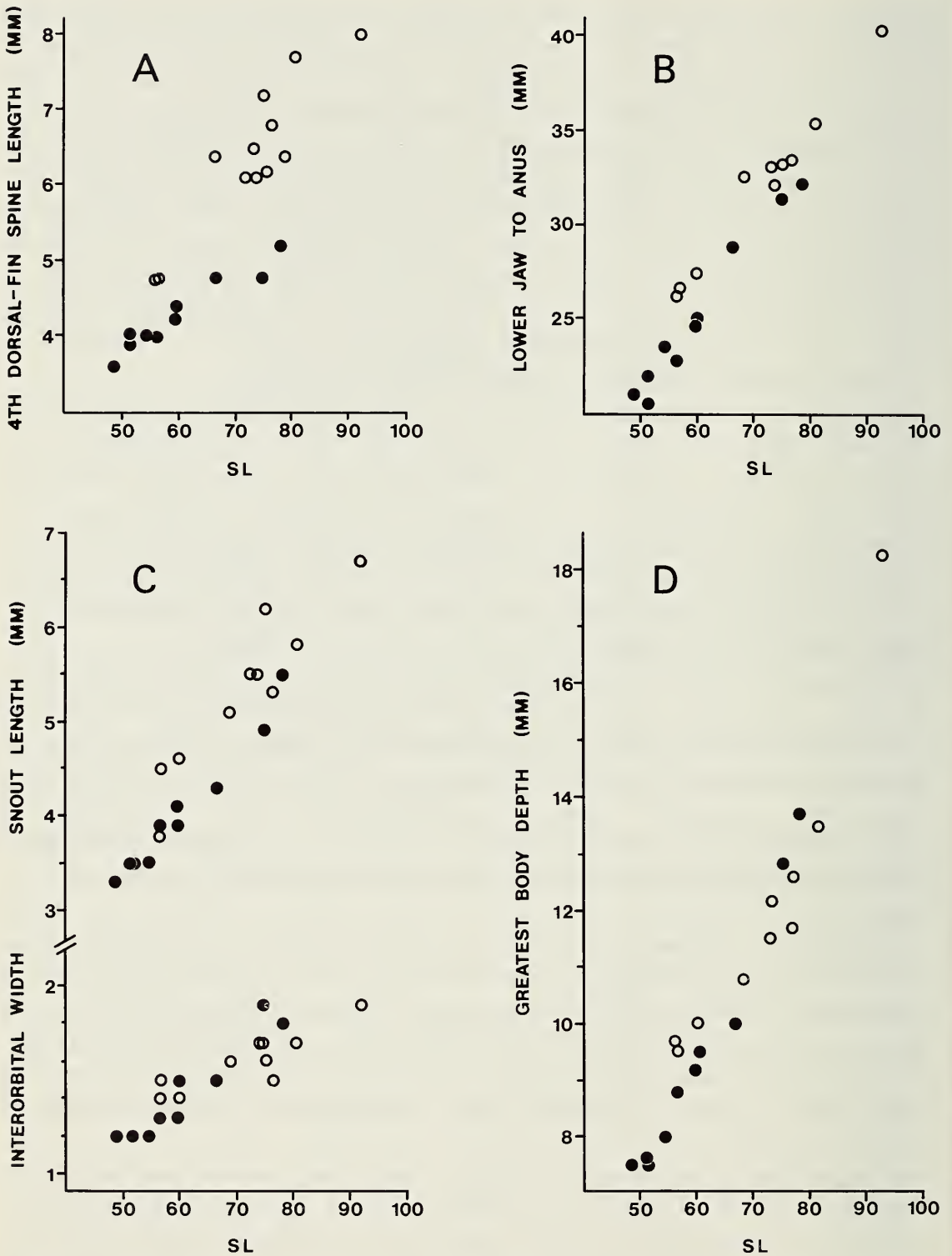


Fig. 3. Relationship between standard length and (A) 4th dorsal-fin spine length, (B) length from tip of lower jaw to anus, (C) snout length and fleshy interorbital width, (D) greatest body depth, in *Parapercis diplospilus* (closed circles) and *P. ommatura* Jordan and Snyder (open circles).

ocellate spot at upper caudal-fin base, and 2 to 3 rows of elongate spots on membrane between segmented dorsal rays. *Parapercis diplospilus* and *P. ommatura* also have similar lateral-line scale counts (58–60 in *P. diplospilus*, 58–61 in *P. ommatura*), number of scales above lateral line (usually 4), and gill-raker counts (8–12 in *P. diplospilus*, 9–13 in *P. ommatura*).

The following characters serve to distinguish *P. diplospilus* from *P. ommatura*: prominent dark spot on lower caudal-fin base (absent in *P. ommatura*); blotches on cheek (versus 2 stripes); 11–21 small spines along posteroventral edge of operculum (versus 1–18, usually 1–11, though spines may be worn down); scale rows around caudal peduncle 22–23 (versus 23–26); scales below lateral line 9–11 (versus 12–13); caudal fin truncate, upper rays slightly longer (versus broadly rounded). In body proportions, *P. diplospilus* has a lower spinous dorsal fin, fourth dorsal-fin spine length 6.4–7.8% SL (versus 8.1–9.6%; Fig. 3A), shorter length from tip of lower jaw to anus (39.6–43.5% versus 43.5–47.5%; Fig. 3B), and shorter snout length (6.5–7.1% versus 6.4–8.2%; Fig. 3C, upper). Greatest body depth and least fleshy interorbital width are smaller in *P. diplospilus* than in *P. ommatura* at small sizes, but *P. ommatura* is more slender with a narrow interorbital space at larger sizes (Fig. 3D and C, lower). Analysis of covariance of the linear regressions using the BMD10V program indicates significant or highly significant differences between the two species in all except greatest body depth, in which the regressions are curvilinear.

Comparative Material

Parapercis ommatura.—JAPAN: Nagasaki, USNM 179803 (5, 56.6–75.3 mm, paratypes), USNM 50260 (3, 61.1–79.0, paratypes); Tsuruga, USNM 50258 (3, 73.2–92.7); Toba Mkt., USNM 151813 (2, 72.9–76.6); Tokyo, USNM 50261 (2, 75.7–89.0). KOREA: USNM 37776 (2, 75.6–79.0). CHINA: USNM 6867 (3, specimens damaged).

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